PATENT ABSTRACTS OF JAPAN

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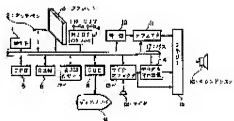
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(54) SINGING TRAINER

(57)Abstract:

PURPOSE: To provide a singing trainer, which is easily
operable, by properly turning on and off audio signals in
synchronization with the progress of the music.
CONSTITUTION: A ROM cassette 7 records a specific
program, a playing information and a corresponding
animation information. When a power supply is turned on
and a process is started, prescribed initial conditions are
set. At that time, a microphone 12 is turned off. Then, a
message is generated from a sound system 16 through a
digital audio processing circuit 14 and a mixer 15 and the
system is put into a standby waiting for an input from a
touch pen 2. When an operator touches a desired picture
with the pen 2, a music related to the animation is
selected and a picture is displayed on a display 9
through a graphic display controller 8.

CLAIMS

[Claim(s)]
[Claim 1]A song practice machine comprising:
An accompaniment sound generating means which generates an accompaniment sound of a
musical piece.
A synthesizing means which mixes and outputs an inputted audio signal and said accompaniment
sound.
A control means which turns on and off said voice signal output suitably synchronizing with
generating/end of said musical piece.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application]This invention is used for the musical education for small children, and relates to a suitable song practice machine and what is called a karaoke device.
[0002]
[Description of the Prior Art]The karaoke device which compounds the accompaniment sound conventionally recorded beforehand as the audio signal inputted from the microphone, and is pronounced via a sound system is known. Here, when the microphone was always made into the ON state, mere speech sound etc. needed to be pronounced via the sound system, and, for a certain reason, problems, such as howling, also needed to turn on and off the microphone suitably with the switch at hand depending on the position of a microphone.
[0003]
[Problem(s) to be Solved by the Invention]By the way, if it was in the song practice machine mentioned above, the microphone needed to be turned on and off with the start/end of the musical piece, and operation was complicated. Although it is more desirable for a small child to be able to operate it alone when using a song practice machine for the musical education for small children especially, when the method of ON and OFF cannot be understood to a microphone, operation is impossible, and a **** result may be brought in greediness for learning. This invention is made in view of the situation mentioned above, and it aims at providing a song practice machine operational very simply.
[0004]
[Means for Solving the Problem]If it is in this invention in order to solve an aforementioned problem, It is characterized by providing a synthesizing means which mixes and outputs an accompaniment sound generating means which generates an accompaniment sound of a musical piece, and an inputted audio signal and said accompaniment sound, and a control means which turns on and off said voice signal output suitably synchronizing with generating/end of said musical piece.
[0005]
[Function]Synchronizing with advance of a musical piece, a control means makes an audio signal suitably an ON state or an OFF state.
[0006]
[Example]
A. **** of an example -- explain the electric constitution of the karaoke device by one example of this invention with reference to drawing 1 first. In a figure, 1 is a handler, and a trigger switch, a joy pad, etc. which are operated by the operator are provided, and it outputs these operation information via the bus 17. 2 is a touch pen and the nib position is detected at any time with the tablet 3. The switch is formed in the nib of the touch pen 2, and if a nib is pressed against the tablet 3, the operation information will be outputted via the bus 17 from the touch pen 2. 4 is a MIDI interface, and transmits and receives a MIDI signal between external instruments.
[0007]5 is CPU and controls other components based on the program memorized by ROM cassette 7. 6 is RAM and read-out/writing of it are attained by CPU5. 8 is a graphic display

controller and outputs a video signal based on the image data supplied from CPU5. This video signal is displayed on the display 9.

[0008]Next, 10 is a sound source, and compounds and outputs a musical sound signal based on the performance information supplied from CPU5. 11 is an effector and performs reverberation/volume control to the musical sound signal outputted from the sound source 10. 13 is a microphone effector and performs reverberation/volume control under control of CPU5 to the audio signal inputted from the microphone 12. 14 is a digital sound processing circuit, changes into an analog signal the digital sound signal supplied from CPU5, and outputs it. The signal supplied from the microphone effector 13 is changed into a digital signal, and the digital sound processing circuit 14 can be memorized to RAM6 via the bus 15. 15 is a mixer, and mixes and outputs the musical sound signal and audio signal which were supplied from the effector 11, the microphone effector 13, and the digital sound processing circuit 14. The outputted mix signals are pronounced via the sound system 16.

[0009]In this example, the sheet body 20 shown in drawing 6 is laid on the tablet 3. Although the sheet body 20 only prints various kinds of figures on paper, this sheet body 20 is formed in ROM cassette 7 and one, and the page opened now is detected by a predetermined sensor. And when the touch pen 2 is operated along with the sheet body 20, an actuated valve position is detected with the tablet 3, and the contents of operation are specified by a relation with the page opened now. The details of this art are indicated, for example to JP,5-137846,A. If it is in the example of a graphic display, the picture of the "bear" and the "pig" is drawn on one page of the sheet body 20, and the picture of the "monkey" and the "rabbit" is drawn on right pages.

[0010]B. Explain operation of an example, next operation of this example. First, if it is in this example, the performance information of various kinds of musical pieces and the moving image information of the animation corresponding to this are memorized with the program as shown in drawing 2 in ROM cassette 7. If a power supply is switched on and processing of drawing 2 is started, predetermined initial setting will be performed in step SP101. The microphone 12 is made into an OFF state in this state. That is, in the microphone effector 13, since the magnitude of attenuation of the output signal of the microphone 12 is set as the maximum, there is no inconvenience by which a microphone noise rides on a performance and other pronunciation. In this step, via the digital sound processing circuit 14 and the mixer 15, the message "something chooses an animal" is pronounced from the sound system 16, and will be in the input waiting state of the touch pen 2.

[0011]Here, if an operator presses the touch pen 2 on a desired picture in the sheet body 20, the musical piece which is related to the animal will be chosen. That is, if the touch pen 2 is pressed against the portion of the picture of a bear, "the dark circles in woods" will press against the portion of the picture of a pig, "three baby pigs" will press against the portion of the picture of a monkey and "the basket store of ****" will press against the portion of a rabbit, "the dance of a rabbit" will be chosen respectively. Thus, after selection of a musical piece is completed, processing progresses to step SP102 and the value of variable TM is set as "1."

[0012]In this example, it is possible to apply a timer interruption for every predetermined time to CPU5, and if processing next progresses to step SP103, this timer interruption will be permitted. Next, if processing progresses to step SP104, a picture as shown in the display 9 at drawing 5 (a) will be displayed via the graphic display controller 8. By repeating processing of step SP104 via step SP105, this picture is changed with the passage of time, and is displayed as animation. In step SP105, if it is judged whether all the pictures that should be displayed were displayed and it is judged with "YES" here, processing will be completed.

[0013]In this example, control of the accompaniment sound of karaoke is performed in a timer interruption processing routine (drawing 3). Hereafter, the details are explained. If processing is started in a figure, in step SP1, the decrement of the variable TM will be carried out only "1." Next, if processing progresses to step SP2, it will be judged whether variable TM is below "0." Here, since variable TM was set as "1" when step SP102 was performed previously, variable TM will be set to "0" if step SP1 is performed first. Therefore, in step SP2, it is judged with "YES" in this case, and processing progresses to step SP3.

[0014]In step SP3, tone data is read from the predetermined region in ROM cassette 7. Here,

the composition of tone data is shown in drawing 4. The event data 31, 33, 35, and 36 and …… which order it a pitch, note one, or note-off like common electrohone as for tone data, It has the duration data 32 and 34 and …… which specify a time interval until it performs the following event data, and the end data 39 in which the end of a musical piece is shown. If it is in this example, the microphone one data 37 which directs microphone one, and the microphone-off data 38 which directs microphone-off are formed.

[0015]In a timer interruption processing routine, whenever step SP3 is performed, these tone data is read sequentially from a head. Therefore, if step SP3 is performed first, the event data 31 will be read. Next, if processing progresses to step SP4, processing will branch according to the kind of read data. Since the event data 31 is data concerning the event of a musical piece, it follows processing to step SP10. If it is in step SP10, based on the contents of the read event data, the pronunciation instructions to the sound source 10 are performed. For example, if the event data 31 is a note one event, a pronunciation channel, a pitch, a velocity, the Keown signal, etc. will be supplied to the sound source 10. And a musical sound signal is compounded based on these, and it is pronounced via the sound system 16.

[0016]Thus, after sound-source-control processing of step SP10 is completed, processing returns to step SP3 and the following tone data is read. If it is in the example shown in drawing 4, since the following tone data is the duration data 32, processing follows it to step SP11 via step SP4. In step SP11, variable TM is updated based on the duration data 32. the contents of the duration data 32 are "180msec" -- a timer interruption -- "-- if it is generating in every 10msec", variable TM will be set as "18" which is both divided result. And after the above processing is completed, processing returns to a main routine (drawing 2).

[0017]henceforth -- "-- if a timer interruption occurs in every 10msec", "1" every decrement of the variable TM will be carried out via step SP1, but in step SP2, it is judged with "NO", and processing returns to a main routine (drawing 2) promptly. Variable TM will be set to "0" if a timer interruption generates this again after "17" ************. Therefore, processing progresses to step SP3 in this case, and the following event data 33 is read. Hereafter, similarly, while the microphone 12 had been made into the OFF state, event data or duration data is read one by one, and reproduction of a musical piece advances.

[0018]Then, if the microphone one data 37 is read in step SP3, processing will progress to step SP6 via step SP4. In step SP6, while the microphone 12 is set as an ON state in the microphone effector 13, an echo is given to the output signal of the microphone 12. Therefore, the audio signal inputted from the microphone 12 is henceforth pronounced via the mixer 15 and the sound system 16. Next, if processing progresses to step SP7, as shown in drawing 5 (b), in the upper right corner of the display 9, the figure 51 with which the form of the microphone was treated will blink, and will be displayed. Thereby, it enables an operator to recognize visually that the voice input with a microphone became possible.

[0019]After the above processing is completed, processing progresses to step SP3 and the processing same with having mentioned above is repeated. In step SP105 of a main routine (drawing 2), the blow-off part 50 is formed in the upper part of a screen, and lyrics are displayed here. Although the background color of the blow-off part 50 is "white" and a character color is "black", a background color is changed into "blue" one by one toward the right synchronizing with advance of a musical piece from the left. That is, a background color is changed so that the portion which should be sung now may be located in the boundary part of a background color. Thereby, it enables an operator to recognize visually the part which should be sung.

[0020]Then, if a musical piece advances and the microphone-off data 38 is read, processing will progress to step SP8 via step SP4. In step SP8, the microphone 12 is set as an OFF state in the microphone effector 13. And if processing progresses to step SP9, the display of the figure 51 in the upper right corner of the display 9 will be eliminated. Thereby, it enables an operator to recognize visually that the voice input with a microphone became impossible. If the processing hereafter same with having mentioned above is repeated and the end data 39 is read in step SP3, processing will progress to step SP12 via step SP4. In step SP12, future timer interruptions are forbidden and processing returns to a main routine.

[0021]Thus, since ON and OFF of the microphone 12 is automatically performed according to

advance of a musical piece (step SP 6 and 8) and the on/off state of the microphone 12 can moreover be visually recognized with the figure 51, even if it is a small child, it is possible according to the karaoke device of this example, to operate it easily.

[0022]C. This invention is not limited to the example which is a modification and which was mentioned above, and various modification is possible for it. For example, although one/OFF timing of the microphone 12 were controlled in the above-mentioned example by including the microphone one data 37 and the microphone-off data 38 in tone data, While accompaniment data is sent to the sound source 10, the microphone control means which sets the microphone 12 as an ON state and sets the microphone 12 as an OFF state with the end of a performance may be established, and the microphone 12 may be made into an ON state after specified time elapse from the start of a performance.

[0023]D. There are the following embodiments in embodiment this invention. "The song practice machine according to claim 1 establishing the displaying means which displays the on/off state of said audio signal." According to this mode, since the on/off state of an audio signal can be recognized visually, it is still more simply operational.

[0024]
[Effect of the Invention]As explained above, according to the song practice machine of this invention, since the on/off state of an audio signal is set up automatically, it is possible to operate it very simply.

[Translation done.]